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## Inspections

### AN ADDRESS

Delivered before the Ninety-second Meeting

OF

The Insurance Society of New York

ON

Tuesday, December 23d, 1913

BY

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The dictionary defines an inspection as "Careful or critical investigation or scrutiny, especially an official examination by persons appointed therefor."

Who made the first fire insurance inspections is an interesting mystery. Mr. Lock mentions how the authorities of London in 1302 compelled Thomas Bat to substitute tile for thatch roofs on houses owned by him and to give bond meantime against damage that might arise from fire in those houses. How did the authorities come to notice those thatched roofs? Evidently some one with the qualities of an inspector existed in those days, though he was not a fire insurance inspector, because fire insurance did not originate until three hundred and sixty-one years later.

The present method probably grew out of the old necessity of obtaining some sort of a report on a risk from the agent who wrote the policy. Before the days of easy communication and ubiquitous field men the agent was the only representative who actually saw the risk. Nowadays not even the agent sees it if you can believe the allegations of some of your New York critics who scoff at the companies for accepting twenty thousand dollars insurance on two chairs and a table, but I wouldn't concede their point until they prove it wasn't antique furniture.

However, we cannot follow the historical development of the inspection system without sacrificing consideration of the system as it now exists. It grew up piece meal, of course, like nearly every other good one, by the work of thousands of workers over many years, but its present state of comparative perfection is principally due to the work of the National Fire Protection Association during the last fifteen years, which has served as a clearing house for the exchange of ideas and the formulation of rules and standards on the subjects with which inspection deals, and which culminated in the production of uniform report blanks for the use of inspection bureaus. Unfortunately the practice of uniformity has not been completely attained because some organizations have as yet not adopted the plan, though their refusal is hard to understand.

The economic value of uniformity to those who read reports is obviously great and no other argument should be needed. The fact that a change in present methods might in some cases mean an increase of expense to some bureau or association is of minor importance compared to the aggregate saving in all the company offices. It goes further than that and there is now the case of a special line of business that cannot be handled from one central bureau, largely because the surveys in different territories are not uniform nor perhaps adequate.

Of course, strict uniformity of inspection reports is only possible among inspection bureaus and rating organizations which alone can devote the necessary time and expense to secure complete detailed information, and it is only necessary with those organizations which send reports to the companies, for the chief value of exact uniformity is the saving of time to those in the offices who read or refer to the reports. Where large lines are written and such reports are therefore read with care, it is difficult to realize how much delay and annoyance is caused by variety in the form of reports unless one has had personal experience. Perhaps it is desired to look up one or two special points about a risk; then it is, or rather, it would be, a great convenience to know that such information is always sure to be in a certain definite place, whether the risk is located in the North, the East, the South or the West.

Inspections group themselves according as they may be made by bureaus, rating organizations, companies, brokers or agents, or by the assured.

Those made by brokers or agents usually have for their real object the securing of the business or clinching present hold upon it. Though the improvement of the fire risk has serious consideration, the direct responsibility for losses does not fall upon such offices and consequently these inspections often show a cheery optimism that a company man cannot share. Everybody admits that much of their work has accomplished remarkable improvement in risks.

Inspections by rating organizations are made for the purpose of rating and though the reports are helpful, yet the system is not planned to be a source of regular information to the companies and years sometimes elapse before a change in the risk requires another inspection and rerating. From the underwriting viewpoint there is a tendency to let the use of a schedule as a measuring stick blind the user to the importance of conditions which may not be recognized by the schedule.

Inspections by special agents are nowadays becoming principally those of the smaller properties since the bureaus have widened the scope and variety of their work. Even if a special agent keeps himself sufficiently well informed to make a good technical inspection, a matter becoming yearly more difficult, it costs too much to inspect the larger risks and he cannot take the required time from his other duties. He usually possesses underwriting judgment and a better knowledge of local business conditions than the inspectors of other organizations, but, generally speaking, the methods of reporting inspections by special agents could be improved by making the questions more specific and more numerous and without taking appreciably more time with a proper arrangement, for after all, the object of an inspection report is to furnish the home office with information on which an underwriting opinion can there be formed, even although the judgment of the special agent may be good in such matters.

The most effective inspections, in regard to putting the property in the best physical condition and maintaining it so, are those made by the assured himself, especially in the case of very large corporations insuring themselves which maintain experts, because their work is the voluntary act of the assured himself. Next comes the work of insurance organizations writing the entire line of insurance, for they can insist on proper improvements without much regard to the competition of others who might be satisfied with less.

The best inspection for complete information is that of an expert in the employ of a company special risk department, for he not only reports fully on the physical aspect but also on the underwriting conditions, although acting for only one company, he is not in a position to obtain physical changes in the risk unless with the sympathy of the owner, but that is not his special function.

Except those made by its special risk department, the most complete inspections received by a company are made by the bureaus established for the purpose of economically furnishing such reports. The necessity for co-operation through such organizations is evident when it is realized that, even with the most careful planning, it costs about \$10.50 to make a bureau inspection, and it is obviously out of the question for individual companies to spend so much. The cost of these inspections has been gradually increasing, due to greater field expenses and to the greater time required to obtain and publish the increased amount of information the companies require.

The bureau inspection is the type in which the greatest number of people have a common interest. It is not more than twenty-five years old, the oldest of these associations having been formed about 1890. In 1885 a writer advocating such a system laid down the requirement that a risk of a given sort should be inspected only by an expert in industries of that kind—there should be an inspector of saw mills, another for woolen mills, a third for cotton mills, and so on. He did not stop to consider whether such specialization would lead. If to-day, however, he were to scan the list of professions for which the inspectors of a bureau had been educated he would find variety enough to fully satisfy him, although he might not approve the all around way in which each man is used. One bureau has men educated in science and physics, engineering and agriculture, mechanical engineering, chemistry, electrical engineering, insurance course among others, and some of their vocations before joining the bureau were as follows: Insurance mapwork, Y. M. C. A. work, steel building construction, construction and paving, railroad construction, telescope manufacturing, fire engine building. Some one of them is sure to be pretty well fitted by education or experience for any special work the bureau may have.

All inspection work depends primarily on the trained inspector, but not every man possesses the right natural qualifications. He requires imagination, not in any inaccurate sense, but to be able to make a mental image of past or future conditions from present indications, otherwise he will not be apt to trace cause from effect or to forecast results. Also he must have a natural liking for the details of industrial developments so that he will be interested to study and understand the processes he sees, for comprehension of fire protection is not complete or its principles capable of satisfactory application unless the nature and degree of the hazards in the problem are clear. Though many good inspectors have been trained only in the school of experience, the majority taken by the bureaus now are those who have had scientific school training for these have already been taught the principles of engineering, physics and chemistry, the fundamental principles of which must be acquired before a proper realization of inspection work can be attained, and the self taught acquisition of such information is comparatively slow and difficult. Of the college taught, those who have had special training in physics and chemistry make the best inspectors, other things being equal, provided the engineering instruction has not been neglected.

Whenever I think of the requisite qualifications for an inspector the training of Kipling's little Eurasian secret service hero "Kim," flashes through my mind. You remember they sent him to a native dealer in gems and curios, in reality a trusted agent of the Indian secret service, who set Kim and two native boys at the game of observing a variety of objects on a tray for a few seconds, then the tray was taken away and each wrote down the names of as many of the objects as he could remember, to the end that observation and memory should be well trained. That would be good training for inspectors. The power of accurate observation is the corner stone of an inspector's ability. Early in my field career I received a salutary lesson in this matter, while yet in the care of an instructor. At the end of an inspection, as we sat in the superintendent's office reviewing the work, the others asked me for any additional suggestions. "Yes," there was some dirty waste in such a place. Nothing would do but they should go to see it. It proved to be colored waste and looked dirty at a little distance, but it was quite clean. It struck me with the force of a blow that waste was not always white and that the evidence of the eye frequently needs confirmation by other senses.

I am firmly of the belief that a logical idea of the processes of all the different industries he sees is essential to the development of the full value of every inspector and have always found preparation in advance of reading, whenever a risk to be visited seemed likely to have processes that were new or unfamiliar, to be well worth all the time it took, not simply reading of articles written from the fire insurance point of view but from that of the manufacturer. This is always feasible in any city with a public library. The knowledge of processes is one of the best introductions to the superintendents of the risks and to others who have directly to do with the manufacturing, for they will warm up to an inspector who can discuss his problems from their point of view and he can much more readily persuade them to make improvements and to give necessary information than one who is not well qualified in this manner. The advantage which knowledge of processes gives in enabling an inspector to consider his task comprehensively is self evident.

They say that Agassiz could reconstruct the entire skeleton of any prehistoric animal if he had one or two of its bones. Similarly the skilled inspector should be able to group mentally the principal processes and hazards which had a part in the

production of any ordinary material or product which is submitted to him.

Every complete inspection should include a brief statement of processes in logical sequence with a more detailed explanation of each that is unusual or new. If you believe this you will agree that the phrase, "Usual to class," used in answer to a question about processes, is very unsatisfactory. Who can say whether usual processes will remain six months without important change in these progressive days. Not one in ten of the inspectors who use that phrase could successfully undergo searching questioning on the subject he thus nonchalantly dismisses. Physiologists recognize a slow, but relentlessly fatal disease known to laymen as hardening of the arteries, the existence and progress of which may be detected by feeling the degree of flexibility of the large artery just in front of the ear. When an inspector first realizes that the use of the phrase mentioned has become a convention—a petrified habit as somebody called it—let him beware lest he be already too far gone in ossification of the observation, which may not be known to physiologists, but which is nevertheless fatal to inspectors.

Most of us have difficulty in using English with brevity and clearness and this trouble is noticeable in inspections, associated with faulty punctuation to which it is largely due. You all know what a joke an innocent little comma played on the Connecticut farmers in the new workmen's compensation law, and you may perhaps have heard of the barber who had such a rush of custom in his new shop because his customers read his notice:

What do you think?

I'll shave you for nothing and give you a drink!  
instead of

What! Do you think I'll shave you for nothing and give you a drink?

A frequent defect in bureau inspections is that they do not make a sufficiently complete statement of fact upon vital questions, except in the complete original reports. Any statement should give an idea of conditions at that time without the necessity of hunting through former reports. It is common to see something like this: "The warehouse has been sprinkled." The careful reader with a large line naturally seeks to know in what condition that leaves the sprinkler protection of the plant as a whole and spends five minutes comparing reports and plan to find out, often by troublesome elimination. Why

could not the inspector add the statement, "All parts of the risk are now completely equipped, except a stable and little detached yard building of relatively small value and importance. A good two supply system." Then we know. Furthermore, a complete, positive statement breeds confidence in the inspector, because it indicates that he must have carefully reviewed the risk as a whole.

Let the writer of a report read it over once before he passes it on, putting himself in the place of the man who is to read it in the company office who probably has not seen the risk. Let him consider what his reader wants to know, whether he has told him unmistakably, and whether he can add a word here, a comma there, or a sentence in another place, in the interest of greater clearness. Every minute he thus expends will ultimately save ten, or perhaps twenty. As in other things it is not first cost, but net profit, that makes economy.

Economy makes necessary the further development of the best of the existing inspection bureaus. The impersonality of the bureau makes it diplomatically valuable, because it secures improvements without causing any particular company to lose its popularity in undertaking reform work, yet its suggestions carry the weight of approval of a large number of companies. Convincing argument and persuasion must be the tools with which it works for it neither possesses, nor seeks, despotic power. These organizations are doing much valuable work, but this is capable of improvement especially in editing reports and more closely following the condition of fire protection.

Inaccuracy of description causes loss of time and errors of underwriting. The continuance of defects in a risk is bound to cause loss of money. No company can protect itself in any feasible way against the increased chance of loss due to the temporary suspension of protection—it cannot cancel, reinsure, or otherwise reduce the line, without too great disadvantage. There is nothing to do but take the chance with a line perhaps several times larger than the temporary circumstances warrant, and breathe a sigh of relief when the trouble ceases. Neither it is sufficiently consoling to say that the rate takes these chances into consideration for many of the new ones certainly do not. Though there has been an improvement of late years the bureaus yet devote too little effort to the detection and remedy of vital defects in protection. In an important case the inspector could afford to stay until he succeeded in getting the correction of the defect.

About two years ago, owing especially to the number of interferences with water supplies from freezing that winter, the need of more thorough testing was emphasized and suggestions were made to the different inspection bureaus for a more thorough and regular test of pressures under flow with a view to keeping track of any decrease in capacity from one inspection to another, as well as to detect important sudden changes such as closed valves. The principal bureaus used the method and it immediately began to develop serious troubles in water supplies, some of which had escaped notice for a long time, perhaps for years.

In one case, a year before this test, a risk had been accepted after some kind of a flow test, and a low rate promulgated. The sprinkler system was fed by city supply only, through a 6-inch pipe from a large city main. At this later flow test the pressure kept dropping until after ten minutes it reached zero. When the flow was shut off it slowly returned to normal. Every gate valve was open, in city mains and elsewhere. As a last resort the water works department was persuaded to dig down and disconnect the sprinkler supply at its point of connection to the main. The connection had been made with a tapping machine to avoid shutting off the water in the large main, a method frequently used. The machine has a drill an inch in diameter which engages the pipe to be cut before the cutter of the large hole begins its work. When the machine is disengaged and withdrawn, the small drill brings out the large disc, which in this case would have been 6 inches in diameter, and constitutes unmistakable evidence of the proper completion of the work. In this case they found that the large hole had not been cut, but only the one-inch drill hole, and the companies had been risking their money on a sprinkler system with a one-inch supply. The tapping was done by an expert sent with the machine from the factory that made it. You can imagine what a glorious state he must have been in when he tried to do the work, for it is quite impossible to believe he did not understand the mechanism. Not long after exactly the same condition was found in a distant city. Other equally important defects have been discovered. This is a good example of the valuable work of inspection, but it is only one of many.

Bureau inspections offer the best means of securing systematic inspection of each risk by the insured himself and there can be no more valuable system, properly carried out, for it is possible to have such inspections every little while instead of only

once in six months. Unfortunately, the assured is not trained in this work and it is the bureau inspector who must train him, which is a part of the educational work of fire prevention which this country must undergo before it can make that economic saving in fire loss which is possible and will in some measure be accomplished when the individual realizes that it is his business and to his personal profit.

I cannot agree with the practice of bureaus to allow inspectors to take out the preceding inspection report except the recommendations for improvements, although there will be many to disagree with me. After seeing the same sentence in report after report, perhaps for years, one cannot help feeling that in that particular matter the inspector is relying too much on the one who preceded him, and occasionally absolute proof of it crops out. What if it does take longer? Let the man think for himself and he will develop greater self-reliance and sufficient speed, besides being stimulated by comparisons.

Do not interpret whatever of criticism or suggestion there may be in this article to denote lack of appreciation for present methods. There can be no reasonable doubt that inspections have made it possible to exercise far greater control over the hazards than would be possible otherwise and these are changing and increasing so rapidly that the ingenuity of inspection organizations is taxed to keep pace with them. It is impossible to determine exactly how much good inspections accomplish and how many fires they prevent. The belief in their value is evidently increasing as the work progresses and the moral position of the skilled inspector has never been so good as now. Estimating inspections to cost 25 per cent. of special and general agent expense, 33 per cent. of rating organization expense, added to that specifically ascribed in state reports to "inspections and surveys," the figures for twenty of the largest companies show that 1.8 per cent. of their total expenses was paid for inspection work in 1912, or \$2,705,343, probably a conservative estimate. On the same basis the 137 stock companies reporting to the State of Connecticut would spend almost exactly twice that amount, or \$5,400,000. The amount spent by the companies directly is large, but the cost of improvements recommended as a result of inspections is very much greater. One large corporation spent \$110,000 in about three years on changes. Indirectly the companies pay most of this outlay also. Considering the total outlay from both points of view it is obvious that inspection work justifies the most painstaking effort to obtain efficiency and economy.



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PRINTED FEBRUARY